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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,669	12/08/2003	Dirk D. Brown	EPC-P107	6370

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EXAMINER

HAMMOND, BRIGGITTE R

ART UNIT	PAPER NUMBER
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2833

DATE MAILED: 02/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/731,669

Applicant(s)

BROWN ET AL.

Examiner

Brigitte R. Hammond

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 November 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 52-65, 68 and 73-93 is/are pending in the application.
- 4a) Of the above claim(s) 63-65 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 52-62, 68 and 73-93 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/3, 1/3 2006, 2/19, 8/8, + 5/25/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims 63-65 have been elected by the applicant to coincide with Figure 9H. However, claims 63-65 are not directed to Figure 9H, thus they are withdrawn from further consideration by the examiner, as being drawn to a non-elected invention 37 CFR 1.142(b). Accordingly, claims 63-67, 69-72, 75-77, 79 have not been further treated on the merits.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "surface of the substrate exposing an exposed portion of the embedded electrical circuit..... a contact element formed on.... the exposed portion...." must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Also in claims 63, and 65 the "two different types" must be shown or the feature(s) canceled from the claim(s); claim 83, "the second exposed portion of the embedded circuit" must be shown or the feature(s) canceled from the claim(s).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

The amendment filed Nov. 2, 2005 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: A surface of the substrate exposing an exposed portion of the embedded electrical circuit..... a contact element formed on.... the exposed portion...."; "a surface of the substrate exposing a second exposed portion of the embedded electrical circuit..... a second contact element formed on.... the exposed portion....".

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

Claims 52-65,68 and 73-93 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably

convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. "A surface of the substrate exposing an exposed portion of the embedded electrical circuit..... a contact element formed on.... the exposed portion....".

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 52,54-65,68 and 73-93 are rejected under 35 U.S.C. 102(b) as being anticipated by Eldridge et al. 2002/0055282. Regarding claim 52, as best understood, Eldridge et al. disclose a connector for electrically connecting to pads formed on a semiconductor device, comprising: a substrate 230; a plurality of electrically conductive contact elements 200 formed on the substrate, said contact elements projecting away from the substrate; and an electrical circuit embedded 218 within the substrate, the electrical circuit being electrically connected to at least one of the plurality of contact elements, a surface of the substrate exposing an exposed portion of the embedded electrical circuit, a contact element formed on and electrically connected to the exposed portion by plating.

Regarding claim 74, As best understood, Eldridge et al. disclose a connector comprising: a substrate 230; a plurality of electrically conductive contact elements 200

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formed on the substrate, said contact elements projecting away from the substrate; and an electrical circuit 218 embedded within the substrate, the electrical circuit being electrically connected to at least one of the plurality of contact elements, a surface of the substrate exposing an exposed portion of the embedded electrical circuit, a contact element formed on and electrically connected to the exposed portion by plating.

Regarding claim 54, the contact elements have curvature.

Regarding claim 55, the contact elements have a wiping surface that is up to approximately 50% of a second surface to which it is wiped.

Regarding claim 56, the contact elements are in vertical alignment with respective pads of the semiconductor device.

Regarding claim 57, the contact elements are coated with a conductive material.

Regarding claims 58 and 78, the contact elements of claim are made from a copper alloy.

Regarding claims 59,60 and 75, the connector connects to solder balls having a pitch of less than 250 microns and the contacts have a plane of contact tangent to a side of the solderballs.

Regarding claim 61, the contact elements have two curved portions.

Regarding claim 62, the contact elements have different mechanical properties (elastic and plastic).

Regarding claim 68, the contact and the circuit are made from the same material.

Regarding claims 73 and 81, the circuit further comprising an interconnected layer.

Regarding claim 76, a base portion and an extending portion are contiguous and made from same the conductive material.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eldridge et al. in view of Applicant's Admitted Prior Art (AAPA). Eldridge et al. disclose the invention substantially as claimed except for the contact elements being separated by a pitch of less than 250 microns. However, applicant discloses in paragraph 0007 that contact elements being separated by a pitch of less than 250 microns are well known in the art. It would have been obvious to one of ordinary skill to modify the connector of Eldridge et al. by providing the contact elements with a pitch of less than 250 microns to accommodate semiconductor packages of that size as taught by AAPA.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brigitte R. Hammond whose telephone number is 571-272-2006. The examiner can normally be reached on Mon.-Thurs. and Alternate Fridays from 7:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula A. Bradley can be reached on 571-272-2800 ext. 33. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Brigitte R. Hammond". The signature is fluid and cursive, with the first name being more prominent.

Brigitte R. Hammond
Primary Examiner
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February 21, 2006